**2.1 Biodiversity and Evolution**

**Classification Hierarchy – Page 3**

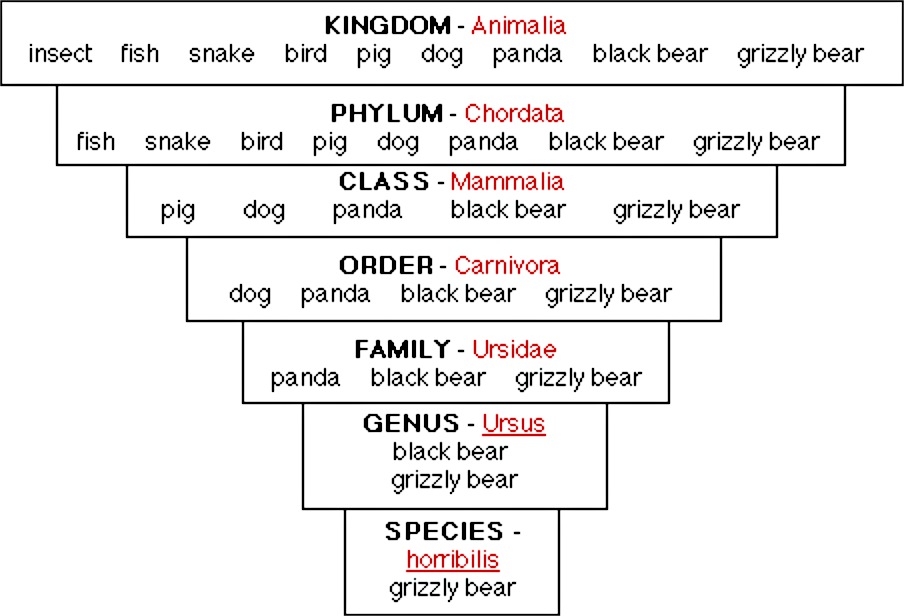
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|  |  | Completed |
| 1. | * Read about the hierarchical classification system  1. What is a taxon? 2. Place the seven major taxa in order from the largest to the smallest. Create a mnemonic to help you remember the order. 3. The different taxa form a hierarchy. What does this mean? |  |
| 2. | * Use the PowerPoint to complete the hand-out summarising the main features of each of the five Kingdoms. |  |
| 3. | * Use the PowerPoint to complete the hand-out summarising the main features of each class of chordates |  |
| 4. | * Use the PowerPoint to make notes about annelids |  |
| 5. | * Use the PowerPoint to make notes about arthropods * Watch brainpop animations on insects and arachnids * Go to shapeoflife.org and watch video about annelids |  |

**Hierarchical Classification**

The basic unit of biological classification is the species. Biochemical, morphological, ecological, behavioural features are all used to help classify species.

Closely related species are grouped together into **genera** (singular: **genus**). Genera are grouped into **families**, families into **orders**, orders into **classes**, classes into **phyla** (singular phylum) and phyla into **kingdoms**. This is the **hierarchical system** of classification; each successive group contains more and more different kinds of organisms.

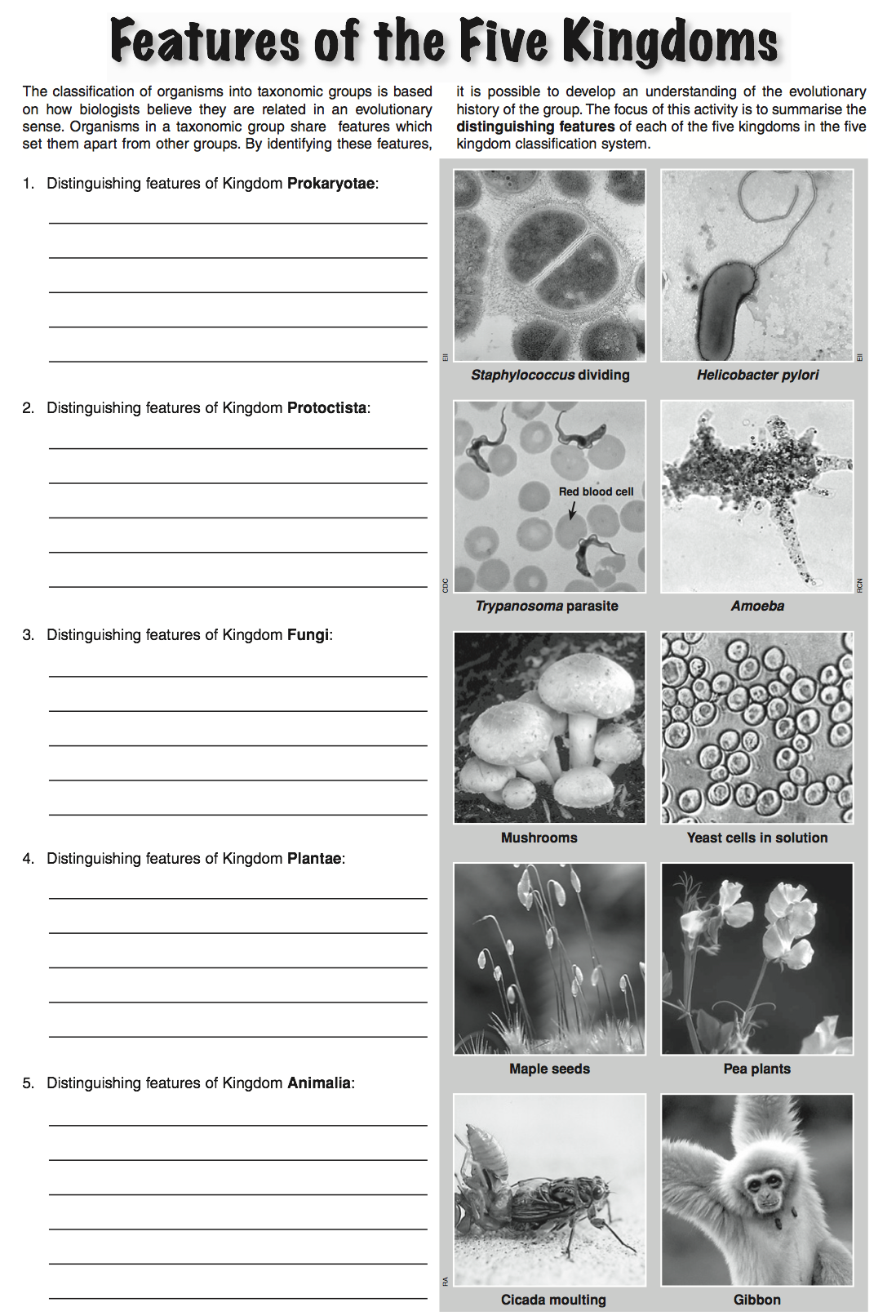
Each grouping of organisms within the hierarchy is called a **taxon** (plural: **taxa**) and each taxon has a rank and a name for example class Mammalia or genus *Homo*.



**THE FIVE KINGDOMS CLASSIFICATION**

The species is the basic unit of classification but classification of organisms does not end with the designation of a specific name. It is also necessary to devise a system of widening groups into which organisms can be placed in order to draw further comparisons. Species are classified into groups that show many similarities of features. These groups of species are, in turn, classified into fewer larger groups that share fundamental similarities.

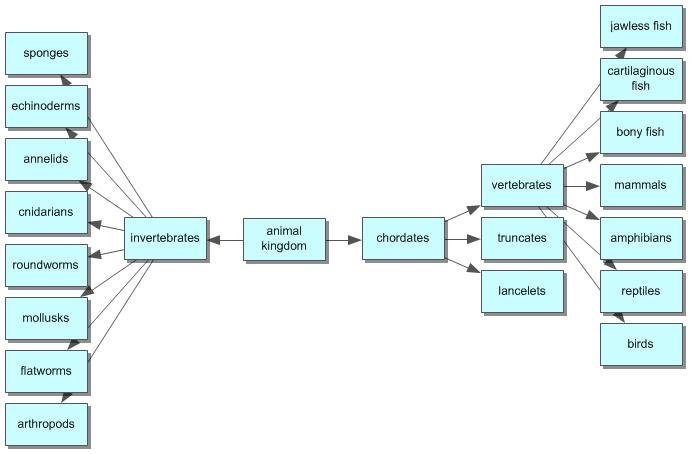
Many different classification systems have been devised throughout history. For a long time, all living organisms were grouped into either the plant Kingdom or the animal Kingdom. However, as more organisms were discovered and studied in more details, they could not all fir into those two categories. Nowadays, the most commonly used system is the Five Kingdom System, a version of which was originally designed by American biologist R. H. Whittaker in 1959.



**Animal Kingdom**

Animals have no cell walls, are multicellular and carry out heterotrophic nutrition. The animal kingdom has over 800.000 species and so far 33 different phyla (plural for phylum) have been described. The phyla are divided on the basis of body symmetry, type of body cavity and external and internal structures.

Animals are classified as shown:



As can be seen the animal kingdom is divided into two main groups.

* Non-chordates, also called invertebrates, examples include arthropods and annelids
* Chordates – all but the simplest have a vertebral column and include fish, birds, mammals, reptiles and amphibians.

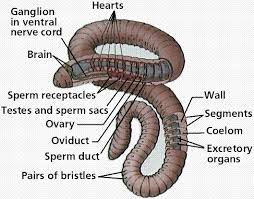
There are 60,000 named species of chordates.

They possess a vertebral column or backbone and a well-developed CNS enclosed in a cranium and an internal skeleton. Chordates are divided into birds, mammals, amphibians, reptiles and fish.

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| --- | --- | --- | --- | --- | --- |
| **Class** | **Birds** | **Mammals** | **Amphibians** | **Reptiles** | **Fish** |
| Picture | Macintosh HD:Users:sarahpreston:Desktop:Screen Shot 2015-01-06 at 15.34.50.png | Macintosh HD:Users:sarahpreston:Desktop:Screen Shot 2015-01-06 at 15.35.11.png | Macintosh HD:Users:sarahpreston:Desktop:Screen Shot 2015-01-06 at 15.35.34.png | Macintosh HD:Users:sarahpreston:Desktop:Screen Shot 2015-01-06 at 15.40.14.png | Macintosh HD:Users:sarahpreston:Desktop:Screen Shot 2015-01-06 at 15.36.18.png |
| Body Covering |  |  |  |  |  |
| Gas Exchange |  |  |  |  |  |
| Reproduction |  |  |  |  |  |
| Body Temperature |  |  |  |  |  |
| Limbs |  |  |  |  |  |
| Terrestrial / Aquatic |  |  |  |  |  |

**Annelids**

(go to shapeoflife.org and watch video on annelids)

8000 named species.

*Annelida* means ‘little ring’ in Latin.

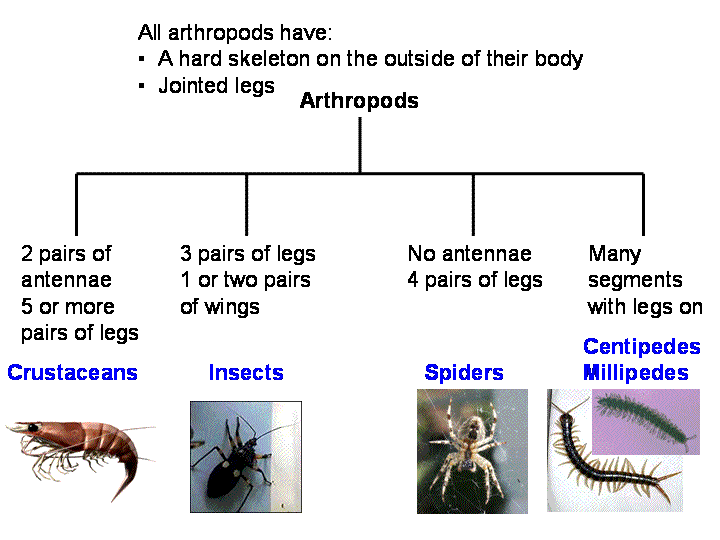
Annelids are far from being lowly worms: They are impressively powerful and capable animals that have adapted to live in most habitats on earth.

Annelids include: earthworms, polychaetes (marine worms), and leeches.

**Features of the Phylum**

* Elongate and bilateral with segmentation  
  The evolution of segmentation was an important step for the annelids because it provided an opportunity for separate regions of the body to specialize for different tasks.
* A coelom (body cavity)  
  A body cavity provides a fluid system against which the muscle system can work effectively. This is why annelids are such effective burrowers.
* Complete circulatory system with capillaries, arteries and veins
* Body wall made of circular and lengthwise muscles
* Continuous gut running from mouth to anus with its own musculature isolated from locomotion musculature
* Bristle-like structures, called setae  
  Setae are thin chitinous structures projecting from body (except in leeches) which help the worm move.

**Arthropods**



All arthropods share the following 3 characteristics:

The advantages and disadvantages of an exoskeleton are:

Advantages:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Disadvantages:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_